

## ABSTRACT

A method and system for generating sound using a speaker having a transducer is disclosed. In a first aspect, the method and system comprise conditioning an input signal; and analyzing the conditioned signal in accordance with at least one transducer model. The method and system further includes providing a drive signal based upon the analysis and modulating a drive signal provided to the transducer. In a second aspect, a method and system for determining the positional BL factor of a transducer during sound transduction is disclosed. The method and system comprises continually at short time intervals measuring the change of the current to the transducer; measuring the back EMF of the transducer; and calculating the present positional BL factor from the change in EMF versus change in current. The new positional BL factor is then utilized directly in the transducer model. In a third aspect, a method and system for measuring the current instantaneous BL factor of a transducer is disclosed. The method and system comprises utilizing the instantaneous BL factor as a means to verify the present position of the transducer. Such position being used dynamically to adjust the transducer driver model for positional nonlinearities. In a fourth aspect, a method and system for generating sound using a speaker having a transducer is disclosed. The method and system comprises determining the positional BL factor during sound transduction through continual measurements, and digitally modulating a drive signal based on a plurality of transducer models and the positional BL factor during sound transduction of the transducer. In a fifth aspect, a method and system for improving a sound generation device is disclosed. The method and system comprises measuring a power supply voltage of the device and adjusting a drive signal to the device to compensate for changes in the power supply voltage. In a sixth aspect, a method and system for protecting a speaker

comprises continually determining a drive provided to a transducer of the speaker and adjusting the drive signal based upon a safe power model of the transducer and the drive power.

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